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An embodiment of the present invention provides a - method for performing a lateral flow assay. The method includes depositing a sample on a test strip at an application region, detecting a first detection signal arising from the test strip in the first detection zone, and generating a baseline for the first measurement zone by interpolating between values of the detection signal outside of the first measurement zone and inside of the first detection zone. The method may include locating a beginning boundary and an ending boundary for the first measurement zone on the test strip. Additional detection zones having measurement zones may also be incorporated with the embodiment.